

XXXIII. *Of the Torpidity of Swallows and Martins.* By James Cornish, Surgeon, at Totnefs, Devonshire, in *fundry Letters to the Honourable Daines Barrington, F. R. S. and Dr. Maty, Sec. R. S.*

L E T T E R I.

TO DR. MATY.

SIR,

Totnefs, Feb. 3, 1775.

Redde, May 25,
1775.

AS it has long been a *defideratum* among the naturalists to decide, with certainty, whether swallows and martins remain in a torpid state during the winter, or are birds of passage; I shall make no apology for troubling you with this letter, as it determines one part of the question, as I imagine, beyond doubt. In the beginning of November, being fishing on the banks of the river Dart, which runs at the bottom of a very steep hill, from the side of which project several large rocks, overgrown with ivy and thicket; I was at once surprized with the sight of a great number of martins. Now the season of the year being so advanced, I desisted from my amusement, that I might the more carefully observe the birds, which, I concluded,

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had been brought out of their winter quarters by the fineness of the afternoon, it being remarkably pleasant and warm for the time of the year; the Sun at that time darting its rays directly against the rocks, just opposite to which I had fixed my station. They continued to flit to and fro for near half an hour, keeping very near together, and never flying in a direct line above thirty or forty yards, and never, when at the farthest, above a hundred yards distant from the rocks; closer to which they now, as the Sun lowered, began to gather very fast. Their numbers now lessened considerably; and in a very short time they all returned into the fissures of the rocks, from whence they had been induced to venture out by the warmth of the evening. I was particularly careful to observe if there was a swallow amongst them; but there was not one. Of this I am certain; for they were several times within the distance of twenty yards from the places where I stood. I was the more attentive to this, as I had been repeatedly assured, by many masters of vessels in the fish-trade, that they constantly saw every autumn, as they sailed up the Mediterranean, vast flights of swallows, bending their course towards the South. From which there is the strongest reason to believe, that these birds, during the winter months, do seek a warmer climate; though Mr. BUFFON has, for want of positive evidence, left that point undetermined. The above account, of which I am at all times ready to attest the truth, settling the question, relative to martins, beyond any doubt, is the best apology I can make for the
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the liberty I have taken in troubling you with it. If I have not been sufficiently circumstantial in this relation, I shall be at any time willing to answer any queries you may think proper to favour me with. I am, &c.

L E T T E R II.

TO THE HON. DAINES BARRINGTON.

SIR,

March 31, 1775.

I SHOULD not have deferred a single post acknowledging the receipt of your favour of the 19th *ult.* if I could so soon have procured a second perusal of your very interesting paper, published in the LXIId volume of the Philosophical Transactions, in which you have thrown so much light on the subject, from the investigation of which I derive the honour of your correspondence. The season, as you observe, is arrived when swallows and martins do usually begin to make their appearance; but there has not yet been one seen in this part of the country, probably from the uncommon coldness of the season; but you may depend on my taking every method in my power to fulfil your request, so far as to get some of the birds shot, as soon as they begin to issue forth from the rocks, where they have undoubtedly remained in a torpid state since the month of November last. I am informed by a person who under-

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stands blowing rocks, that it is almost impossible to come at the bottom of the fissures of these in question. It could not be done but by gun-powder, and then at a great expence, and not without danger of destroying much of the field above; besides, the force of the powder pervading every hollow, would inevitably annihilate the birds, and so frustrate the end of our labour. I conceived the idea of destroying the rock in its full force, at the time when the martins entered it, as I concluded, for their winter's dormitory; and believe, that had the weather continued favourable, I should have actually attempted it: but on reflection it did not appear, that the discovery would have been adequate to the difficulty and expence that would have attended it. For there is certainly nothing more extraordinary in finding martins, in a state of torpidity, than dormice or bats, which are animals equal in bulk to the swallow or martin. Dormice are frequently found dead to all appearance in the winter in old hedges; and we can procure bats at all times, in any number, from a subterraneous place, called Kent's Hole, near Torbay. Now if the examination of the intestinal tube of one of this tribe of mungrel animals in a torpid state, should be thought worth attending to, it can be done at any time. Bats, indeed, are sometimes seen in winter, in very mild weather; though none have yet made their appearance with us. And I am ready to attest, if occasion should require, that I have seen martins in Totness in the months of December and January; though I do not remember ever to have seen a swallow

swallow in the winter. Upon the whole, I cannot help thinking my own evidence, with respect to the martin, to be absolutely conclusive, as is likewise the testimony of Mr. STEVENS and Dr. FYE; though it is to be regretted, that these gentlemen should have left any doubt, whether the birds found in the mud were swallows or martins? And Mr. KLEIM, in his paper *De Hibernaculis Hirundinum*, asserts, that his father found three black martins or swifts in an old oak during the winter, which on being laid before a fire, soon recovered strength enough to fly about the room, though they died soon after. The objection which has been brought against the opinion, that these birds do remain torpid during winter, is; that all birds do moult once in a year, and swallows do not moult with us. Now this argument is of little weight with me; as I am of opinion, that no bird that is to remain in a torpid state during winter, can undergo the process of moulting; for it is probable, if I may hazard such a conjecture, that the great loss of blood, which other birds suffer during the change of their feathers, is saved by nature, in birds which undergo a state of torpidity, for their more effectual preservation in such a state. And I have known many instances of birds kept in cages that have not moulted for a season; particularly a sky-lark, which retained his song in full vigour during the autumn and all the winter. Attempts have been made to bring on a torpid state on the birds in question, by confining them in a cold cellar; but without success. The force of this objection seems to be

lost when we consider, that in this situation the birds must be in continual fear, and consequently not disposed to make that change, to which instinct has directed them, for their preservation and security; since all their attempts are to get out of confinement, as long as they have any spirit or strength left; and when these are exhausted, they die in course: and, I think, this state must be induced by a disposition in the animal itself, and cannot be brought on by compulsion. I hope I shall be successful in my endeavours to procure some of the martins at their first appearance; as the being any way instrumental to oblige you will be a very great satisfaction to, &c.

L E T T E R III.

TO THE HON. DAINES BARRINGTON.

SIR,

Totness, May 9, 1775.

I CAN make no other apology for having so long delayed writing to you, but a desire to get as much information, as would make my letter worthy your perusal; and if facts, as well established as the nature of things can well admit, are allowed to be of any consequence, I hope I have not entirely failed of success. Mr. TRIST, the present recorder, and late member of parliament for this town

town, assures me, that he once saw many martins in the winter, about Christmas, flying to and fro under a large rock, not more than a mile from Totness, and also near the river. Mr. DEVER, a reputable farmer, is ready at any time to make oath, that he once found a swift in the church of Ashprington, in the middle of winter; that he took it in his hand, and though it shewed no signs of life, he is certain, it could not have been dead but a few hours. He supposes it dropped from the roof, at a time when some masons were at work, repairing a breach. THOMAS DIDHAM also affirms, that he once saw, on the 26th of December, two swallows or martins, flying in a gentleman's court of Syfferton; that it was a pleasant day; and that he then supposed that they had issued from the old thatch-covering of the out-houses. But here follows a direct evidence, as to the torpidity of one kind of bird. Mr. WIAT made oath, last Sunday, in the parish church of Haberton, before me and a creditable witness, that in the winter, and near Christmas, he once found, in a hollow ash-tree then taking down, a bird covered with a kind of down; that on handling it, it shewed signs of life; that the two labourers who assisted in felling the tree, also handled it; that when they first perceived the bird, it appeared to be dead, yet the heat of their hands made it move briskly; and that this bird he believes to have been a cuckow. As the story of the cuckow plucking off his feathers, and remaining torpid during the winter in hollow trees, is generally believed in this country, the establishment of the fact appeared

peared to me of considerable importance; and if I have succeeded in this point, I hope you will have no objection to the manner of ascertaining it. I would wish to avoid a weak credulity on one hand, and obstinate scepticism on the other. Again, Mr. ACHARD, of Privy Garden, may be now living, to testify the truth of the account of the torpid martins, which he saw taken out of the banks of the Rhine, and which, in his letter to P. COLLINSON, esquire, read before the Royal Society, he so particularly describes. Now to prove the torpidity of birds, we have the presumptive evidence of Mr. TRIST, DEVER, DIDHAM, and myself; and the positive evidence of Mr. ACHARD, Dr. PYE, Mr. STEVENS, and Mr. WIAT; all men of character, and incapable of asserting an untruth. The opinion of ARISTOTLE, that some of the same species of birds do emigrate; and that others do pluck off their feathers, and remain torpid during the winter, cannot obtain credit: for we cannot suppose that these animals are governed by different instincts, in what immediately concerns their existence; but by the same universal law of nature, independent of their wills or inclination. But then the law of nature must be permitted to have its free course. Restraint destroys the rule of actions; and therefore, though M. BUFFON and others succeeded not in their attempts to bring on torpidity in swallows confined in cold cellars, yet I have pleased myself with the idea of confining young swallows, martins, &c. with the old ones; which may be easily taken at their nests when feeding, in a large walled garden, covered with a net or lattice,

in which there should be a pond. Probably the young birds, if the garden were large enough to find them food, would not be uneasy under their confinement. If this experiment succeeded, it would be curious to observe them in the different degrees of torpidity during the winter. The intestines might at different times be inspected, and their analogy with those of the torpid bat carefully observed. I have had an opportunity of examining the *viscera* of several torpid bats. The intestinal tube was perfectly empty, except about half an inch from the *anus*, where there was a little hard *feces*. The gall-bladder was filled with a pellucid, yellowish fluid. The ball of FAHRENHEIT'S thermometer being laid in the body of one of them, the heat of the blood at the heart raised the quicksilver two degrees. In three others, opened at the same time, no heat could be perceived, either by the thermometer or by the touch. These experiments being made in the beginning of April, it is reasonable to suppose, that the bat which affected the thermometer, had begun to feel the approaching season. I think there is reason to believe, from the small quantity of *feces* in the intestines, and from its being so near the *anus*, that those animals, when they find themselves growing torpid, take sufficient food to serve them during the winter. All the animal functions in this state are carried on exceedingly slow; but that they do go on, in some degree, is evident from their emptiness, emaciation, and the *feces*, which are found in plenty underneath the place where they hang in clusters.

The birds, of the swallow tribe^(a), which I have procured, exhibit perfect plumage and extreme leanness; the intestines empty, except the gizzard, which contained a substance most like small twigs or straws. Swifts have not yet made their appearance with us; the first that can be procured shall be examined. The result shall be the subject of a future letter, when I hope once more to have the honour to subscribe myself, &c.

(a) N. B. I had desired him to shoot some of those which first appeared, and examine their intestines; as I also did with regard to the torpid bats.

D. BARRINGTON.